

What Is Claimed Is:

1. A packet communication device, comprising:

a plurality of line interfaces capable of, of
reception and transmission of a packet, at least either;

5 a plurality of ports, to which said plurality of line
interfaces are connected, and, to which at least one
functional processor to be used in order to perform
functional processing on an incoming packet received by any
of said plurality of line interfaces, can be connected as
needed;

10 a function item judgment unit for judging a function
item to be required for said incoming packet;

15 a forwarding information generator for determining a
forwarding port for said incoming packet in accordance with
said function item obtained by judging by said function item
judgment unit, and imparting, to said incoming packet,
forwarding information, that is information for designating
said forwarding port; and

20 a forwarding path switching unit for switching a
forwarding path when forwarding said incoming packet among
said plurality of ports on the basis of said forwarding
information.

25 2. The packet communication device according to Claim 1,
wherein when it has been judged by said function item

judgment unit that a plurality of functional processing is required for said incoming packet, in order to forward said incoming packets successively to a plurality of ports, to which functional processors capable of executing functional processing required are connected respectively, plural forwarding information are imparted to said incoming packet.

3. The packet communication device according to Claim 2,
10 wherein in order to forward those incoming packets which have been subjected to said plurality of functional processing to any of said plurality of line interfaces, said forwarding information generator further imparts, to said packet, forwarding information corresponding to a port, to
15 which the forwarding line interface is connected.

4. The packet communication device according to Claim 2 or
3, further comprising a forwarding information eliminator
for eliminating, after said incoming packet is forwarded to
20 a predetermined port on the basis of said forwarding information, forwarding information corresponding to said port from forwarding information added to said incoming packet.

5. The packet communication device according to Claim 2 or 3, wherein as said incoming packet is successively forwarded on the basis of said forwarding information, said forwarding information generator further imparts, to said incoming 5 packet, subsequent forwarding information for designating in said forwarding information which information concerning the subsequent forwarding destination is, and

wherein said device further comprises a forwarding information renewal unit for renewing, after said incoming 10 packet is forwarded to a port to be designated in said forwarding information and said subsequent forwarding information, said subsequent forwarding information.
6. The packet communication device according to Claim 5, 15 wherein said forwarding information and said subsequent forwarding information will be erased before said incoming packet is outputted to the outside from any of said plurality of line interfaces.
- 20 7. The packet communication device according to any of Claims 1 to 6, wherein said functional judgment unit and said forwarding information generator are installed in at least one of said plurality of line interfaces.

8. The packet communication device according to any of Claims 1 to 7, wherein at least one said functional processor is further provided with said functional judgment processor and said forwarding information generator.

5

9. A packet communication device, comprising:

a plurality of line interfaces capable of, of reception and transmission of a packet, at least either; one or a plurality of functional processors to be used in order to perform functional processing on an incoming packet received by any of said plurality of line interfaces; a plurality of ports to which said plurality of line interfaces and said one or plural functional processors are connected;

15 a function item judgment unit for judging a function item to be required for said incoming packet;

 a forwarding information generator for determining a forwarding port for said incoming packet in accordance with said function item obtained by judging by said function item judgment unit, and imparting, to said incoming packet, forwarding information, that is information for designating said forwarding port; and

25 a functional processor with a forwarding information generation function for performing functional processing on said incoming packet, determining, as a forwarding port, a

port to which any of said plurality of line interfaces is connected on the basis of a result of said functional processing, and imparting, to said incoming packet, forwarding information corresponding to said forwarding 5 port.

10. The packet communication device according to Claim 9, wherein said function item judgment unit and said forwarding information generator are incorporated at least in one of 10 said plural line interfaces, and

wherein when, in said forwarding information generator which is incorporated in said plural line interfaces, all forwarding ports including a port, to which a line interface for transmitting said incoming packet to 15 the outside is connected, cannot be determined, said incoming packet is forwarded to a port to which said functional processor with said forwarding information generation function is connected.

20 11. The packet communication device according to Claim 10, wherein when said incoming packet conforms to a first item of communication protocol, all forwarding ports including a port, to which a line interface for transmitting said incoming packet to the outside is connected are determined

by the line interface which has received said incoming packet, and

wherein when said incoming packet conforms to a second item of communication protocol which is different from said 5 first item, in said functional processor with said forwarding information generation function, a port, to which a line interface for transmitting said incoming packet to the outside is connected, is determined as a forwarding port.

10

12. A packet communication device, comprising:

a plurality of line interfaces capable of, of reception and transmission of a packet, at least either;

15 a plurality of functional processors capable of performing the same functional processing on an incoming packet received by any of said plurality of line interfaces;

a plurality of ports to which said plurality of line interfaces and said plurality of functional processors are connected;

20 a function item judgment unit for judging a function item to be required for said incoming packet;

a forwarding information generator for determining a forwarding port of said incoming packet in response to said function item judged by said function item judgment unit, 25 and imparting, to said incoming packet, forwarding

information for designating said forwarding port, wherein
when the same address information is imparted to said
incoming packet to be received successively by any of said
plurality of line interfaces, a port to which the same
5 functional processor is connected, of said plurality of
functional processors, is fixedly designated as said
forwarding port; and

10 a forwarding path switching unit for switching a
forwarding path when forwarding among said plurality of
ports on the basis of said forwarding information.

13. The packet communication device according to Claim 12,
further comprising one or plural functional processors
capable of functional processing different from said same
15 functional processing, wherein

when it has been judged by said function item judgment
unit that plural types of functional processing are
necessary for said incoming packet, said forwarding
information generator imparts, to said incoming packet, a
20 plurality of forwarding information corresponding to a
plurality of ports, to which plural types of functional
processors corresponding to functional processing of said
plural types are connected respectively.

14. The packet communication device according to Claim 13,
wherein said function item judgment unit further comprises:

a function search unit for searching, on the basis of
address information imparted to said incoming packet, types
5 of functional processing required by said incoming packet
and a port to which a line interface for transmitting said
incoming packet after the processing to the outside is
connected;

10 a function item search unit for searching function
items of functional processors connected to said plural
ports and a connection number for each function item; and
a port search unit for searching function items of
functional processors to be connected correspondingly to
each of said plural ports.